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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,428

12/09/2005

Luca Lazzeri

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5744

22442

7590

06/08/2009

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EXAMINER

BROWN, COURTNEY A

ART UNIT

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1616

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,428	Applicant(s) LAZZERI ET AL.	
	Examiner COURTNEY BROWN	Art Unit 1616	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgement of Receipt/Status of Claims

This Office Action is in response to the amendment filed March 4, 2009. **17-34** are pending in the application. Claims **1-16** have been cancelled. Claims **17-34** are being examined for patentability.

Rejections not reiterated from the previous Office Action are hereby withdrawn. The following rejections and/or objections are either reiterated or newly applied. They constitute the complete set of rejections and/or objections presently being applied to the instant application.

New Rejection(s) Necessitated by the Amendment filed on March 4, 2009

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 17-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Potter et al. (WO 97/14309) in combination with Brown et al. (*Journal of Chemical Ecology*) in view of Sarwar (*Plant and Soil*, previously cited) and Taniguchi et al., (*Agricultural and Biological Chemistry*) .

Applicant's Invention

Applicant claims a method of improving soil and killing soil pathogens comprising contacting soil with a composition comprising seed flour containing at least one glucosinolate and the enzyme myrosinase, wherein the seed flour contains a seed selected from the group consisting of seeds of *Brassica carinata* A. B., seeds of *Capparaceae*, and seeds of *Barbarea verna* wherein the seed flour has been de-oiled.

***Determination of the scope and the content of the prior art
(MPEP 2141.01)***

Potter et al. teach pesticide precursor compositions comprising bran from a mustard of the genus *Brassica* and methods for controlling soil pests such as insects, nematodes, mites, fungi, and bacteria (page 2, lines 15-20, claims 24,25, and 34 of instant application) by application of the pesticide precursor composition to the soil (abstract, claim 17,27, and 31 of instant application). Porter et al. teach that the mustard bran may be mixed with an agriculturally acceptable carrier such as cracked mustard seed of lower grade that has been processed into flour (pages 4, lines 34-end to page 5, lines 1-9, claims 17 and 22, seed flour from seeds of at least two different vegetable varieties of instant application). Potter et al. teach that on contact with water in the soil, the glucosinolate sinigrin of the mustard bran is converted by myrosinase, also from the mustard bran, to form the active pesticide, allyl isothiocyanate (AITC) (page 2, lines 21-27, claims 17 ,27,29 - 31 of instant application). Potter et al. teach

Art Unit: 1616

that the mustard bran may be applied to the soil in a similar manner to the application of materials such as granular fertilizers (page 4, lines 26-29).

Brown et al. teach that a variety of plant pests are suppressed by the incorporation of cruciferous plant material into soil (abstract). Brown et al. teach that glucosinolates are produced exclusively by dicotyledonous plants and those with high concentrations of glucosinolate are in the families *Cappariceae* and *Brassicaceae*. Brown et al. teach that the enzyme degradation of glucosinolate results in the formation of a number of allelochemicals which are considered for use as pesticides (see page 2022). Specifically, Brown et al. quantify glucosinolate degradation products occurring in soil amendments with **defatted** rapeseed meal in combination with a **wire worm** bioassay (see page 2003).

***Ascertainment of the difference between the prior art and the claims
(MPEP 2141.02)***

The difference between the invention of the instant application and that of Potter et al. and Brown et al. is that the instant invention requires the use of seeds from the species *Capparaceae* and *Brassica carinata* A.B. to kill soil fungal pathogens of the genus *Fusarium*. For this reason, the teaching of Sarwar et al. is joined. Sarwar et al. teach that isothiocyanates (ITCs) released from *Brassica* seed meal amendments incorporated into soil have the potential to suppress pest and disease organisms in soil (abstract, claim 17, 27 and 31 of instant application). Sarwar et al. teach that methyl

Art Unit: 1616

isothiocyanates commonly occur in *Capparaceae* species and that 2-propenyl isothioxyanates commonly occur in *Brassica carinata* species (table 1, page 105, claims 20 and 21 of instant application). Additionally, Sarwar et al. teach performed tests that measure the *in vitro* effects of isothiocyanates which shows that fungi such as *Fusarium* is sensitive to methyl and 2-propenyl isothiocyanates (see figures 1 and 2, pages 107-108, claims 20, 21, 26. and 28 of instant application).

Another difference between the teachings of Potter et al. and Brown et al. is that the instant invention claims the use of seeds flour that has been de-oiled at a temperature below 75 degrees Celsius. For this reason, the teaching of Taniguchi et al. is joined. Taniguchi et al. teach a preparation of defatted mustard by extraction with supercritical carbon dioxide (SC-CO₂) at **40°C**. Taniguchi et al. teach that the synigrin content and myrosinase activity in the defatted mustard seeds with SC-CO₂ at 300 atm and 40°C for 3 hr were comparable to those in native seeds. Therefore, Taniguchi et al. concedes that the extraction with SC-CO₂ made it possible to prepare **defatted mustard of high quality** without decreasing the synigrin (a **glucosinolate**) content and **myrosinase** activity (see abstract).

Finding of prima facie obviousness

Rationale and Motivation (MPEP 2142-2143)

Art Unit: 1616

It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of the two cited references to arrive at a method of improving soil and killing soil pathogens comprising contacting soil with a composition comprising seed flour of a seed selected from the group consisting of de-oiled (defatted) seeds of *Brassica carinata* A. B., seeds of *Capparaceae*. One would have been motivated to make this combination in order to receive the expected benefit of having a composition that has seed flour that is specifically fungitoxic to fungi of the genus *Fusarium* and is of high quality without the decrease in the synigrin (which is a glucosinolate) content and myrosinase activity as disclosed in instant claims **17, 23, 27 and 29-31**.

All the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded predictable results to one of ordinary skill in the art at the time of the invention.

Therefore, the claimed invention as a whole would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made because every element of the invention has been fairly suggested by the cited reference.

Response to Arguments

Applicant's arguments, filed November 4, 2008, with respect to the 103 rejection of claims 17, 20-31, and 34 under 35 U.S.C. 103(a) as being unpatentable over Potter

Art Unit: 1616

et al. (WO 97/14309) in view of Sarwar (*Plant and Soil*, 201:103-112, 1998) have been considered but are moot in view of Applicant's amendment(s).

Applicant's arguments, filed November 4, 2008, with respect to the 103 rejection of claims 18,19,32, and 33 under 35 U.S.C. 103(a) as being unpatentable over Potter et al. (WO 97/14309) in view of Franke (US Patent 5,525,746).have been considered but are moot in view of the new ground(s) of rejection.

Examiner's Response to Applicant's Declaration of Facts Filed Under 37

C.F.R. 1.132

Applicant's Declaration under 37 C.F.R. 1.132 filed on March 4, 2009 has been considered but is not persuasive. The Declaration of Luca Lazzeri provides data from tests which demonstrate that the release of isothiocyanates (the compounds responsible for improving the soil) from the claimed seed flour is surprisingly higher than expected. Specifically, Applicant shows that de-oiled seed flour at 60 °C unexpectedly shows a percentage release of isothiocyanates that is more than three times the activity of the original (not de-oiled) seed flour (see figures 2 and 3 on pages 3 and 4). The Examiner agrees with this data. However, the data in the Declaration of Luca Lazzeri is not commensurate in scope with the instant claims. The instant claims are related to a method of improving soil and a method of killing soil pathogens and soil parasites comprising contacting said soil with seed flour containing at least one **glucosinolate**

Art Unit: 1616

and the enzyme **myrosinase**. There is no mention of isothiocyanates in the instant claims.

The claims remain rejected.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public

Art Unit: 1616

PAIR. Status information for unpublished applications is available through Private PAIR Only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electron Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Courtney Brown, whose telephone number is 571-270-3284. The examiner can normally be reached on Monday-Friday from 8 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, Johann Richter can be reached on 571-272-0646. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Courtney A. Brown
Patent Examiner
Technology Center 1600
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*/Mina Haghighatian/
Primary Examiner, Art Unit 1616*